



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/788,678

02/27/2004

John McKenna Brennan

3-82-47

3590

7590

04/12/2006

Ryan, Mason & Lewis, LLP  
Suite 205  
1300 Post Road  
Fairfield, CT 06824

EXAMINER

CAO, PHAT X

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/788,678

Applicant(s)

BRENNAN ET AL.

Examiner

Phat X. Cao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |



It is noted that when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). Therefore, because the adhesion layer 52 is segmented, the power transistor device would inherently exhibit a reduced amount of bowing relative to an amount of bowing expected without the segmenting of the adhesion layer.

Regarding claims 3-4 and 7, Malhi's Fig. 3 further discloses that the adhesion layer comprises metal material 52 arranged in distinct segments that are uniformly spaced along the adhesion layer, and the voids between one or more of the segments are substantially free of material (see Fig. 3 labeled above).

Regarding claim 9, Malhi's Fig. 3 also discloses that the adhesion layer 52 comprises one or more voids, at least one of which extends partially through the adhesion layer 52.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 8, 10-12, 13-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malhi in view of Tonami et al (US. 2002/0125566).

Art Unit: 2814

Regarding claims 2, 10 and 20, Malhi does not disclose that the adhesion layer 52 is selected from nickel having a thickness as claimed.

However, Tonami (Fig. 5E) teaches a semiconductor device having an electrode layer 2 or 15 comprising an adhesion layer 15a of NiCr having a thickness of about 400 angstroms (not shown, see par. [0066], lines 1-3). Accordingly, it would have been obvious to use nickel as the material for the adhesion layer 52 of Malhi because nickel has an adhesion characteristics, as taught by Tonami (par. [0068], lines 1-3).

Regarding claims 11-16, Malhi does not disclose an additional metal layer of palladium and a wettable-surface layer of gold sequentially associated with a side of the adhesion layer 52.

However, Tonami (Fig. 5E) further teaches that the electrode layer 2 or 15 attached to the back surface of the substrate 1 comprises a segmented additional metal layer 15c of palladium and a wettable-surface layer 15d of gold sequentially deposited on a side surface of the adhesion layer 15a of NiCr (par. [0066]). Accordingly, it would have been obvious to modify the device of Malhi by sequentially depositing an additional metal layer of palladium and a wettable-surface layer of gold on a side surface of the adhesion layer 52 because the additional palladium layer would function as a barrier layer for suppressing the diffusion between the adhesion layer and the wettable-surface layer, and because the wettable-surface layer of gold would function as a wire-bonding layer for bonding to an external terminal, as taught by Tonami (par. [0068], lines 1-7).

Regarding claim 8, Tonami's Fig. 5E further teaches that the electrode layer 2 or 15 comprising the adhesion layer 15a is arranged in distinct segments that are non-uniformly spaced along the adhesion layer. Therefore, it would have been obvious to arrange the adhesion layer of Malhi in distinct segments that are non-uniformly spaced along the adhesion layer because rearranging the adhesion layer segments would provide no functional differences and because it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

***Allowable Subject Matter***

5. Claims 5-6 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose a power transistor device having the voids between the segments comprising a low stress material (i.e., polymer) (as recited in dependent claims 5-6), or fails to disclose a power transistor device having the adhesion layer partially segmented by patterning along two or more intersecting axes of the power transistor device (as recited in dependent claim 19).

***Response to Arguments***

6. Applicant argues that the metal layer 52 of Malhi cannot be called as "an adhesion layer" as claimed.

It is noted that "an adhesion layer" made of metal is a labeled that does not structurally distinguish over "a metal layer" in the prior art. The prior art "metal layer" functions as "an adhesion layer". Labels, statements of intended use, or functional

Art Unit: 2814

language do not structurally distinguish claims over the prior art, which can function in the same manner, be labeled in the same manner, or be sued in the same manner. See *In re Pearson*, *Ex Parte Minks*, and *In re Swinehart*. In this case, "a metal layer" of the prior art would be called as "an adhesion layer" made of metal as claimed because it is also made of metal and it is also adhered to the substrate.

Applicant further argues that the segmented metal layer 52 of Malhi does not function as "exhibiting a reduced amount of bowing relative to an amount of bowing expected without the segmenting of the adhesion layer".

This argument is not persuasive because of the following reasons:

First, as clearly stated in the ground of rejection, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). Therefore, because the adhesion metal layer 52 is segmented, the power transistor device would inherently exhibit "a reduced amount of bowing relative to an amount of bowing expected without the segmenting of the adhesion layer".

Second, it has been held that once a reference teaching product appearing to be substantially identical is made the basis of a rejection and the examiner presents evidence or reasoning tending to show inherency, the burden shift to Applicant to show an unobvious difference. *In re Fitzgerald*, 619 F. 2d 67, 70, 205 USPQ 594, 596 (CCPA 1980). In this case, since the examiner has provide the burden of presenting a *prima facie* case of obviousness, the burden is shifted to Applicant to come forward with evidence which persuasively rebut the examiner's *prima facie* case of obviousness.

Art Unit: 2814

Therefore, if Applicant believes that the segmented metal layer 52 of Malhi would not function the same as the segmented metal layer as claimed, then Applicant is requested to support that position with facts.

Applicant also argues that it would not be obvious to combine Malhi with Tonami because the metal layer 15 attached to the substrate 1 is not a segmented adhesion layer.

This argument is not persuasive because of the following reasons:

First, the metal layer 15 of Tonami is "an adhesion layer" because Tonami clearly states at paragraph [0068], lines 2-3 that "the NiCr film 15a functions as an adhesion layer for the substrate 1". And the adhesion metal layer 15 is considered as a segmented adhesion layer because it is segmented into a plurality of portions as shown in Fig. 5E.

Second, Tonami is not relied on for teaching the segmenting of the adhesion layer. Malhi discloses the segmenting of the adhesion layer. Tonami is relied on for showing that it was known to form an adhesion layer as a Nickel material because the nickel material has an adhesion characteristic. Therefore, Tonami clearly suggests the motivation for combining the references as suggested.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within



Art Unit: 2814


TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is 571-272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC  
April 7, 2006

  
PHAT X. CAO  
PRIMARY EXAMINER